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ABSTRACT

To examine clinical implications for using maternal language as a dimension of assessment and intervention, a linguistic and behavioral analysis was completed on a mother suspected of neglect during interaction with her 5-month-old failure-to-thrive infant. Results of the videotaped sample were compared to previous research on maternal language and a second mother addressing her medically ill infant. The verbal language of the mother suspected of neglect differed in sentence form, word content, and communicative and rhythmical aspects of speech believed to convey affect. In addition, her nonverbal behaviors differed in proximity and holding patterns. The failure-to-thrive infant's communicative behavior, compared to the second infant, differed in amount and quality of vocalization, gaze, and smile. Clinical implications are discussed, including the need to examine parent-to-child language in terms of rhythmical or prosodic patterns, endearing terms, rate of production, use of commands, exclamations, rising-falling pitch patterns, amount of pause time allowed the child, and word types. Also noted is the importance of identifying positive signalling behaviors in the infant that may encourage maternal interaction. (CL)

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Use of Maternal Language in the Clinical Assessment of the Mother-Infant Dyad: A Case Study.[1]

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Abstract:

A linguistic and behavioral analysis was completed on a mother suspected of neglect during interaction with her five-month-old infant who was diagnosed as failure to thrive. Results of the video taped sample were compared to previous research on maternal language and a second mother addressing her medically ill infant. Verbal language of the mother suspected of neglect differed in sentence form, word content, communicative and rhythmical aspects of speech that are believed to convey affect and her nonverbal behaviors differed in proximity and holding patterns. The failure to thrive infant's communicative behavior, compared to the second infant, differed in amount and quality of vocalization, gaze and smile. The potential for using maternal language as a part of assessment protocols of the mother-infant dyad is discussed.

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Introduction

Several themes have emerged from the theoretical and empirical research on infant communication that hold significance for clinicians working with infants, young children and their families. First, the infant is seen as an active participant in its own development as demonstrated by its social interaction with the primary caregiver, usually the mother. During their social interaction, mothers and infants often function as a dyadic system and intrinisic to this system is the mother's communication of affection [1,2,3, 4,5]. During social routines, mothers and babies exhibit reciprocity, or turn taking behaviors, where their communicative acts resemble the structure of adult conversation [6,7]. From the infant's participation in, and practice of, these communicative acts with the primary caregiver, it has been suggested that the foundation for later language and speech is established [8,9]. Finally, during their socially interactive routines, both infants and caregivers simultanesously, or sequentially close in time, coordinate several behavioral components to signal communication [10, 11,12,13,14].

From the time of the infant's birth, the mother uses a special language register when talking to the child. The prosodic or rhythmical patterns of caregiver language[2] have been viewed as major organizers of the infant's behavior and as a primary means through which the caregiver displays affect during social exchanges [13,14]. The infant, in turn, responds to the mother's expressive behaviors through vocalization produced in conjunction with other gestural movements. That is, the verbal productions of the caregiver and the

[2]The expression maternal language is used interchangeably with linguistic input, baby talk, parental language/speech and caregiver language/speech.

vocal behavior of the infant, occurring simultaneously and/or sequentially close in time, in both mother and child appear to facilitate and maintain social exchanges.

The special linguistic modifications of maternal language include short, simple repetitive utterances that are syntactically correct, special vocabulary items such as endearing terms and changes in speech sound processes such as dere/there and seepy/sleepy. Maternal language also incorporates adjustments in pitch, loudness, rate and rhythm of speech. The latter are prosodic characteristics that appear to be used in a predictable manner and seem to serve mainly affective functions allowing the mother to communicate feelings of warmth and comfort [cf.13,14,15].

At a time when mothers use this special language register and construct verbal-vocal routines with the infant, the mother also seeks to etablish an affectionate bond with the baby. In other words, maternal language is a dominant component of the socially oriented behaviors directed to the child during the process of bonding and subsequent attachment.

A mother who does not feed her baby or in other ways deprives the child of emotional nurturing, e.g., failure to comfort during extremely long periods of crying, does not hold, cuddle or play with the baby, exhibits symptoms of neglect. A mother's unadapted language, occurring in conjunction with other neglecting behaviors, may also serve as additional information to be considered in cases where neglect is suspected [16,17]. Identification of maladaptive maternal language patterns can be clinically useful in the intervention process where the goal is to improve the quality of the parent-child interaction.

PURPOSE

Numerous studies discuss maternal language and its relationship to the child's language learning process, however, the use of maternal language during

clinical assessment and as a primary dimension for facilitating communication between parent and child during stages of bonding and attachment has not been emphasized. Therefore, the purpose of this article is to use a single case to discuss characteristics of maladaptive maternal language input and to demonstrate that maternal language is a viable measure in clinical assessment. First, a descriptive account of the language style that a mother, suspected of neglect, directed to her five-month-old female infant who was diagnosed as failure to thrive will be presented. Secondly, aspects of the language used by the mother will be compared with reports in the literature for 'normal' mother-infant dyads. Finally, due to lack of normative or developmental data on linguistic input, empirical linguistic and nonlinguistic data collected on a second mother-infant pair will be used for purposes of comparing maternal language styles. Based on the descriptive account and language comparisons, clinical implications for using maternal language as a dimension of assessment and intervention will be discussed.

METHOD

Subjects: The Family Constellations

The primary subjects for this study were two separate mother-infant pairs. One mother-infant pair consisted of a 23 year old mother who was suspected of neglect (MSN) and her five-month-old female infant who was diagnosed as failure to thrive (FTT). The second pair consisted of a 25 year old mother (MMI) who interacted with her 10 week old, medically ill (MI), female infant, diagnosed as having an upper respiratory infection and an allergic reaction to medication resulting in a facial and body rash.

The family constellation for the MSN included the husband-father, the infant and a 21 month old female sibling. During separate interviews by a psychiatrist, both parents reported personal histories of abuse and neglect and

both reported marital problems. Because the mother had been a "ward of the state" for a number of years, records available confirmed her reports of her personal and educational history.

Little information was available on the father's history, including clarification of age, because of his unwillingness to cooperate. However, the mother reported that the father was physically beaten as a child, that at age six years old his father removed him and other siblings from their mother, and that he was only allowed to attend school during bad weather and was forced to work during good weather. He was graduated from high school at the age of 19 years old.

The mother reported that her own mother did not want her and would not allow her to live with her father. The mother was reared in a series of foster homes. The mother could recall no pleasant childhood memories. When she was 12 years old, her father died as a result of suicide. Other vivid childhood memories included not being permitted to attend a birthday party because she was "bad", frequent problems in school and quitting school in the ninth grade. She had a history of drug abuse, including use of heroin and selling drugs. The mother reported that she had been incarcerated and after release lived in group homes. She eventually met the husband and they married two years after meeting, when the first daughter was born. Both children were unplanned pregnancies. The mother reported that she was physically abused by the husband, however, denied that he would or did abuse the children.

The infant was a five-month-old female who was admitted to the hospital because of limited weight gain (3400 grams upon admission). Subsequent medical evaluations resulted in a diagnosis of nonorganic failure to thrive with parents suspected of neglect. Medical records obtained from the hospital of the infant's delivery revealed that, at birth and upon discharge, the infant was

considered clincally normal. For this child, the mother reported a conflicting postnatal history that suggested confusion around feeding and other caregiving activities, as well as social and emotional neglect. An infant psychological evaluation at age 5 months suggested a normal range of functioning for cognitive abilities. During the time of the infant's hospitalization and for three months of follow-up the family was treated by a team including pediatrics, psychiatry, social services, nursing and speech-language pathology.

The 21 month old child received medical, psychological, speech and language evaluations during the period of the infant's hospitalization. In the areas of cognition, language and speech, formal testing revealed a normal range of functioning.

The family constellation for the second mother-infant pair consisted of the mother, the husband-father and the infant. The MI infant was the first and only child for these parents and no problems were reported relative to the husband-wife relationship. Both parents were college graduates.

The reader should keep in mind that the primary purpose of this article is to describe maladaptive maternal language and to demonstrate that language is a viable clinical measure when neglect is suspected. Clearly, the two mother-infant pairs are not a matched sample, however, there are no conclusive data indicating that socioeconomic status (SES) is significantly correlated with amount and quality of maternal language directed to young children. The lack of developmental or normative data on maternal language cause other difficulties in describing language input that is clincally perceived as unadaptive, relative to general parent-child interaction patterns in western culture.

Due to the lack of available normative data, lack of conclusive evidence of influence of SES on motherese and in an attempt to report characteristic examples of maladapted verbal behavior of the MSN, the MMI's language and

communicative style were employed as representative of linguistic features frequently associated with parental language. The tape of the MMI and her infant was selected because of the need for a relative measure to highlight the differences in the MSN's language directed to her infant and because of the need to account for whether these language differences may have been stimulated by the infant's illness. Further, the tape of the MMI talking to her baby was initially used in the viewing session carried out by three team members to verify clinical impressions.

For comparative purposes only, the linguistic, and where possible, the nonverbal behaviors of the two mothers were inspected relative to each other. Also, where possible, aspects of the infants' behavior were compared. This type of comparison is consistent with a clinical approach to assessment when no normative or developmental data are available. Such a clinical approach allows the practitioner a means of establishing initial directions for intervention. For example, it should become apparent from the maternal nonverbal analysis to follow that having the MSN move closer to the baby, look more at the baby and increase amount of coordinated talking and smiling directed to the baby would be appropriate areas in which to begin intervention.

Equipment:

Instrumentation consisted of a Sony video recorder and camera (AVC 3400, 3400) and a tripod. The equipment weas situated approximately five feet from the infants and the observer stood behind the camera and tripod where the infant could not see her face.

PROCEDURE

Data Collection:

Two weeks after the failure to thrive infant's hospitalization and at a time when the infant was medically stable, the speech-language pathologist (SLP)

evaluated the infant's vocal and communicative functioning. The communicative interaction between the mother suspected of neglect and her infant was first observed in the infant's hospital room and later, on the same day, video taped in the hospital playroom where both were familiar with the environment due to the infant's period of hospitalization. The second mother-infant pair were video taped in the home prior to the identification of the mother suspected of neglect and were participants in a study of normal vocal development. The same SLP interacted with and taped the sessions for both mother-infant pairs. Both mothers were given similar instructions prior to the taping sessions. That is, both mothers were asked to play with their babies in their usual manner, i.e., 'Show me the things that you do with the baby when you're alone.'

DATA ANALYSIS

Exploratory Analysis: Initial Clinical Impression:

During the course of the taping session of the FTT baby, it was observed that the mother was not using some of the components of language known to characterize speech addressed to infants and young children. In addition, the mother placed the baby in an infant seat, maintained a distance of 3-4 feet from the infant unless asked to move closer and she did not hold the baby unless asked to do so. She did not look at the infant in a manner that would establish face to face communication and frequently snapped her fingers from a distance to get the infant's attention. The infant produced limited vocalization, displayed gaze and head aversion and stiffened body when the mother approached.

The initial clinical impression was confirmed by having the pediatrician, the psychiatrist and the SLP review the tape together and by their comparing the tape of the FTT infant with other tapes of mother-infant dyads during different types of interactive sequences. Compared to reports in the literature and the other video tapes, these three team members verified the initial impression that

the mother suspected of neglect used a different language style when addressing her infant and that the infant was not vocally and visually responsive to the mother. However, the baby was responsive to the observer/SLP, a stranger, when stylized prosodic patterns of baby talk were directed to the infant.

From repeated viewings of the tape of the MSN and infant, comparison of their behavior with other mother-infant dyads and knowledge of the family history, it was determined that the differences observed in their interaction were primarily affective in nature with the most striking feature of the mother's behavior being her limited use of what are believed to be the affective components of maternal language. The team discussed the implications of these observations and designed an intervention program with the primary focus on assisting the mother in changing her verbal language style relative to the infant.

The goal of assisting the mother in developing her ability to observe and identify elements in her own behavior that would be most stimulating to the infant was based on three factors: (1) given the mother's history, she had not received sufficient nurturing so that she could, in turn, soothe her baby when problems arose; (2) portions of the video tape demonstrated the mother's willingness to change her behavior in relation to the infant as evidenced by immediate imitations of the clinician's modelling and; (3) she verbally stated that she wanted to continue discussions with the speech-language pathologist. The pediatrician continued to monitor the infant's medical status and the psychiatrist provided treatment to aid in coping with the family constellation concurrent with the SLP working jointly with mother and infant in the hospital.

Among the major components of the language intervention program were the SLP modelling how to use maternal language to elicit responses from the infant, demonstrating feeding and appropriate verbal reactions to feeding and other

caregiving activities and demonstrating how to talk to the infant with emphasis on varying rhythmical patterns of speech to elicit gaze and smile. Verbal communication, incorporated with appropriate looking, holding and touching behaviors were also modelled. After each demonstration in the six hours of sessions conducted over a two week period, the mother was immediately encouraged to replicate the activity while the clinician provided positive verbal feedback to both mother and infant. During these sessions, the mother was also given information on capacities of babies to help her develop more realistic expectations of the infant. Over the two week period, the mother began to increase use of verbal language patterns characteristic of motherese when addressing her infant and changed her overall communication style in relation to the infant. In turn, the infant became more responsive to the mother. After a two week period, and when medically appropriate, the infant was released from the hospital and followed on a weekly basis for three months. The mother continued to work at her relationship with the infant and during follow-up sessions additional demonstrations were provided. The family continue to be followed by the hospital staff. By age five years, no additional severe neglecting or abusive incidents were reported between the mother and the infant initially diagnosed as failure to thrive.

Post Hoc Analysis:

Based on observations during intervention sessions, reports from the pediatrician, the psychiatrist and other health care professionals, it was determined that the original video tape was representative of the communicative interaction between the MSN and FTT infant. To further quantify clinical impressions, a post hoc linguistic and behavioral analysis was completed on the language produced by the MSN. Using such a post hoc analysis to extract primary elements employed in the communicative assessment process with one mother-infant

pair also provides a way of offering quantitative and qualitative information that can be generalized for use with other mother-infant pairs where neglect is suspected.

Two types of maternal nonverbal (nonlinguistic) behaviors were measureable from the tape of the MSN, proximity or distance from the infant and type of holding patterns. These two behavioral components provide a qualitative picture of the interactive style used in attempts to engage the infant. Duration of different maternal distances from the infant and duration of different types of holding patterns at these distances were determined by using a continuously running stopwatch to establish time in minutes and seconds. From repeated viewings of the tape, infant vocal and physical activity were noted in relation to the speaker, i.e., mother or observer (SLP).

Transcription and Coding

Two independent observers trained in analyzing language samples recorded written transcripts of all maternal utterances. An utterance was defined as any vocalization produced by the mother that was preceded and followed by a pause and considered to be the conversational equivalent of a sentence [18, 19]. Utterances on which the observers disagreed were discussed and agreement was achieved on questionable utterances. For all language and vocal behavior analyzed, 100% agreement was achieved between two listener-judges.

All maternal utterances addressed to the infants by the MSN and the MMI were transcribed and classified by the same two listener-judges who used the definitions in Appendix A to code maternal language. Maternal language samples obtained for both mothers were analyzed for amount and type of language directed to the children relative to total interactive time. Interactive time was defined as those segments where the mothers attempted, through verbal or nonverbal means, to engage the child or to elicit a response from the child.

The maternal transcripts were coded for several language measures frequently used in input studies. These measures included number of utterances produced, total number of words used, average number of words per utterance (Mean Length of Response-MLR), word content and word class, variation of vocabulary usage (Type Token Ratio-TTR) and types of grammatical sentences produced. The same transcripts were coded for pitch direction on utterance contours and rate of utterance production. Analysis of prosodic elements included pitch direction and rate [20,21]. Infant noncry vocalizations were phonetically transcribed.

RESULTS and DISCUSSION

Infant Communicative Behavior:

Duration of vocalization, gaze (looks) and smiles were measured separately for the FTT and the MI infants (in minutes and seconds). Frequency of occurrence or how often the behavior occurred was counted by number of episodes. In Table 1, duration and episodes for these infant behaviors are shown relative to total interactive time.

Considering proportional relationships or rate of occurrence, the FTT baby vocalized less than the MI infant. Quantitatively, the MI infant produced more substantive vocalization more often than the FTT infant. Although vocalizations for the FTT baby were weak in intensity, short in duration and contained limited pitch shifting, vocal loudness level was judged to be commensurate with respiratory capacity and body size.

Combining looking and vocalizing is a critical component of infant communicative signaling behavior and measures of combined looks and vocalization revealed that, during maternal interactive attempts, the MI infant coordinated vocalization and gaze for 32 different episodes. The FTT infant exhibited 0 episodes of coordinating gaze and vocalization directed at a listener. Moreover, the FTT infant looked at a stranger, the observer, for a longer time

(total of 56 secs.) than she looked at her mother (total time 23 secs.). The FTT infant also smiled at her mother less (16 secs.) than she smiled at a stranger (41 secs.). Alternatively, the MI infant looked and smiled mainly at her mother. Although Trevarthen [22] has suggested that 18-20 week old infants may attend to a stranger longer than to the mother, this FTT infant's limited signals of communication with the mother appeared to have a stronger relationship to the mother's style of interaction.

Qualitatively, the FTT infant also exhibited gaze aversion and head aversion during some of the mother's attempts to engage her. At other times, when the mother attempted to elicit a response, the FTT infant persisted in object manipulation, particularly of pacifier and clothes, and nondirected gaze, behaviors described in the literature [23,24] as maladaptive patterns of interaction.

Maternal Behavior

Proximity:

A comparison of the nonverbal behaviors of the MSN and the MMI is shown in Table 2. Relative to proximity or distance from the infant, the MSN spent nearly half of the interactive time at a distance of 3-4 feet from the infant, even when she attempted to engage the baby. When at a closer distance, ranging from 0-2 feet from the baby, maternal attempts to engage the baby consisted of making unrealistic demands on the child, e.g., trying to get the child to stand. When the MSN did hold the baby in her arms, she often positioned the child's face away from her own face or turned her face away from the child.

Overall, the MSN spent most of the interactive time at a distance inappropriate for facilitating face to face communication or in attempting to get the infant to behave in an unrealistic manner. On the other hand, the MMI mother spent her total interactive time looking at her baby and/or trying to get

the baby to look at her while within a distance of 12 inches from the infant.

Pitch and Rate of Production:

Pitch and rate of speech production are prosodic components and were used here as measures of affect. Extensive pitch variability and slower rate of speech are characteristic features of maternal language. Table 3 displays the overall pitch patterns for each of the mothers and Table 4 provides comparative measures of maternal talking time frequently used in studies of linguistic input. Relative to total talking time, the MSN produced less pitch variability than did the MMI. The MSN produced more level pitch patterns, possibly reflective of depression. In motherese, frequent whispering is thought to be employed by parents as attention getting devices. The MSN's increased rate of whispering, spoken at a distance from which the infant may not have heard the mother could not serve as an adequate means of getting the baby's attention.

Although the MSN produced the basic pitch patterns expected in motherese, there was a qualitative difference observed when her speech was compared to the second mother. Slightly more than half (52%) of the MSN's utterances contained either a level pitch (33%) or whisper (19%). Although a rising pitch direction was heard 26% of the time, these were judged to be low rises and the quality did not approach the type of high rise expected in maternal language. In contrast, the second mother used a rising pitch on nearly half (45%) of her utterances. Qualitatively, ammenton, or nursery pitch, frequently heard in motherese, was not heard in the infant directed language of the MSN. This means that a primary characteristic of input language used to convey affect and to encourage socialization was found to be greatly reduced in the language of the mother suspected of neglect when talking to her FTT infant. In other words, maternal prosodic patterns were not used communicatively.

Mean Length of Response (MLR):

Table 4 presents the Mean Length of Response (MLR) or average sentence length and bears a relationship to rate of production. Rate at which speech is produced is influenced by the speaker's pause time, the amount of time the speaker allows for the listener to take a turn. The average number of words per sentence then, can be affected by the rate at which sentences are spoken. Based on MLR results, the MSN produced shorter utterances than did the MMI. The utterance rate per minute suggests that the MSN did not employ the longer pauses usually found in motherese. The MSN spoke at a faster rate than did the MMI and the rate at which the MSN spoke did not allow sufficient pause time for the infant to respond or take a turn.

Word Content and Word Class:

The total number of words directed to infants and Type Token Ratio (TTR) are displayed in Table 4. The TTR is a measure of the variability of different word types. In effect, the lower the TTR, the more often the same words are used producing a less flexible the vocabulary. The MSN used slightly less varied vocabulary than did the MMI.

Table 5 displays percent occurrence of different word categories. Exploration of maternal word types indicate that the MSN showed a decreased frequency for certain word categories expected to occur at a higher rate in maternal language. For example, the MSN produced fewer nouns and more pronouns than did the MMI. Typically, in baby talk, proper names (nouns) and kin terms are substituted for pronouns for purposes of clarifying to whom or what the mother is referring, e.g., 'give it to mommy' would be expected versus 'give it to me.'

For the MSN, there was an increased use of verbs and her verb usage was found to be related to the number and frequency of commands directed to the FTT

infant, e.g., 'stand up' or 'give me a smile' spoken in a commanding voice. Auxillaries refer to auxillary verbs, items that function to modify verbs. The percentage of auxillaries produced by either mother is too small to interpret. Adverbs and articles are smaller linguistic elements that modify verbs and nouns, respectively. The MSN's increased rate of adverbs is related to the increased rate of verbs spoken. The rate of occurrence of articles and conjunctions is too small to interpret for either parent. However, number of conjunctions in the speech of both mothers is suggestive of a smaller percentage of complex sentences, indicating that both used simple sentences, a common characteristic of motherese.

The MSN produced fewer adjectives, but of more importance is the quality of adjectives spoken. When referring to the infant, she did not use endearing terms, or diminuitives, i.e., nicknames or words believed to convey affection. In contrast, the MMI often referred to her baby as 'sweetie' and made declarations such as 'you're a pretty, sweet, little darling.' Although the MMI seems to produce an increased number of diminuitives, there is no data indicating average expectancies for a given period of mother-child interaction.

Exclamatory words tend to occur frequently in maternal language and are used to get and direct the child's attention. The MSN's reduced rate of exclamatory words is consistent with her level pitch patterns, i.e., an increase in exclamations would necessitate increased variation in pitch. Prepositions are used to show relationships between words. The MSN's reduced prepositional usage is related to shorter utterance production.

Overall, the MSN produced a similar range of categories as the MMI in that she did use, to some degree, all of the 10 word types examined. However, closer inspection of the content of the actual words produced by each of the mothers revealed differences. For instance, the type of adjective that one would expect

to hear and those that communicate feelings of affection were not found in the sample for the MSN. She did not use endearing terms, made no reference to self as mother, made no reference to the child's body parts, mutually shared objects, body functions or basic qualities. She did not use proper names or kin terms in place of pronouns and did not refer to the infant's illness, linguistic features thought to communicate emotion. In other words, the MSN did not produce the types of words often used as communicative devices by mothers who are attempting to establish joint attention and and joint interaction (reciprocity) with their infants. Alternatively, the MMI overemphasized the use of these maternal language components, particularly use of cute, endearing terms produced with rising intonation (exclamations).

Grammatical Function (Syntax):

Table 6 displays percent occurrence of different types of sentences. In linguistic input, one would expect to hear a higher percentage of exlamations and question forms than commands. The MSN, however, produced a high proportion of commands. Commands represented 46% of the MSN's total percentage of sentences while the MMI directed no commands to her infant (0%). In addition, the same commands were repeatedly directed to the FTT infant and these redundant commands were related to the reduced variation in vocabulary found for the TTR.

Exclamatory utterances are commonly thought of as emotional in nature and often do not contain the grammatical form of a complete sentence. In relation to word content, or semantics, exclamations also function as expressions of the speaker's feelings. The MSN produced exclamatory utterances 24% of the time while the MMI's exclamations represented 33% of the total sample. Declarativce sentence types are used to make a statement about or refer to changes in events and situations. Declaratives represent 10% of the MSN's sample and 29% of the MMI's sample. All types of question forms analyzed, yes-no, tag and wh-

questions, occurred at a lower rate for the MSN (10%) than for the MMI (38%). In sum, the MSN produced a higher percentage of commands and a lower percentage of exclamations, declarative and question forms, respectively. Exclamations, declarations and questions are expected to occur at a higher rate in linguistic input.

When Tables 2 to 6 are explored in relation to one another, the mother suspected of neglect, compared to the mother of the younger, medically ill infant, spoke to the FTT baby at a rapid rate, frequently produced the same short commands and used level or whisper pitch more often, suggestive of flat affect. Moreover, maternal language was most often directed to the FTT infant from a distance of 3-4 feet. The FTT infant, compared to the MI infant, displayed less substantive vocalization and a decrease in other nonverbal behaviors that typically signal readiness to communicate. The following discussion highlights the significance of these measures for clinical assessment.

Clinical Application:

Relative to the existing body of research on linguistic input, against which both mothers can be compared, the MMI exhibited nonverbal behaviors and infant directed language consistent with other descriptive reports of the mother-infant dyad. Using the same body of research and the MMI's language input as representative of previous descriptions, the MSN displayed differences in nonverbal communication and in aspects of language and language related behaviors when talking to her infant diagnosed as failure to thrive. The MSN did not physically position herself or the infant in a manner that would be conducive to communication. When the linguistic components of pitch, rate of speech production, average sentence length, word meaning, word type and sentence structure were inspected for the MSN, the primary differences found indicated

that linguistic components believed to convey affect were considerably reduced or absent.

With regard to the infants, contrasting the behavior of the FTT and MI babies may seem an unfair comparison since they are not a matched sample. However, when there is no normative data, clinically, one is often pressed to employ experience, training and careful observation for purposes of maximizing diagnosis and intervention. The manner in which the psychiatrist, the pediatrician and the SLP initially compared these babies allowed the practitioners to isolate three infant behaviors that could be increased in frequency of occurrence, vocalization, looks and smiles. By determining how these behaviors were combined during interactive sequences with the mother, the following objectives could be implemented during the intervention process: (1) increase different types of noncry vocalization, because the mother wanted to 'hear her say something besides crying'; (2) encourage simultaneous looking and vocalizing directed to the mother and; (3) encourage and increase smiling behavior directed to the mother. Knowledge of infant reflexes, e.g., development of smiling, served as the basis for increasing infant communicative signals. The clinician modelled and the mother imitated until she discovered that she could consistently elicit the same positive communicative signals without the clinician. Table 1 lists infant behaviors that other practioners may employ as a guide when observing infants.

A mother who does not feed her baby or in other ways deprives the child of emotional nurturing exhibits symptoms of neglect. A mother's unadapted language may also be considered in the array of characteristic symptoms of child neglect. As a necessary step in documenting that the presence of maladapted language can be observed and described in some mother-infant dyads, the detailed post hoc analysis was completed. Emerging from the analysis are several principles that

may be generalized for application to other asynchronous mother-infant dyads. For example, when observing mother-infant interaction, listen for type of language the parent directs to the child. Of particular relevance linguistically are the parent's use of rhythmical or prosodic patterns, endearing terms, rate of production, use of commands, exclamations, rising-falling pitch patterns, amount of pause time allowed the child, different word types and structure of the sentences. Perceived differences observed in each of these identifiable linguistic components may be considered as evidence to further explore a particular mother's language patterns.

Alternatively, lack of feedback from the infant, for whatever reason, may reduce the mother's willingness and ability to continue to stimulate the baby. This is a particularly difficult situation when the mother has experienced limited nurturing and/or has and is experiencing other psychosocial problems. Consequently, the clinician may search for positive signaling behaviors in the infant, even if reflexive, that serve to encourage maternal interaction.

Crediting the language based program designed for the mother suspected of neglect as a primary reason for successful intervention does not rule out the importance and influence of other services provided, e.g., psychiatry, nursing, pediatrics, social service. Rather, it presents evidence for each team member being aware of the necessity of assessing the infant as a participant in a functional, communicative unit where the language directed to the child is a viable clinical measure. Based on the analysis presented in this article, components of maladapted maternal language can be described and when considered in relation to other symptomatic characteristics of neglect may function as a useful basis for initiating treatment with the mother-infant dyad. Simply, start with assessing communication, determine the major linguistic contributors that are perceived as different when the mother talks to the baby, discuss with

the mother and determine if she is willing to change aspects of her language style. In this case, identifying maladaptive maternal language led to assisting the mother suspected of neglect in adjusting her verbal language patterns in the context of other co-occurring communicative acts. Changes in verbal language coordinated with additional factual information about the abilities of babies assisted both mother and infant in developing a closer relationship with each other.

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APPENDIX A

Definition of Terms

1. Utterance - Defined as a vocalization produced by the mother that was preceded and followed by a pause, marked as a single unit (/) and considered to be the conversational equivalent of a sentence [18, 19, 20, 21].
2. Word - "... the standard orthographic unit, with dictionary reference. Exceptions included divisions of hyphenated words into separate words and the division of elisions into two words... When colloquial usage made two words into one, the standard English usage was substituted" [18, p.18].
3. Mean Length of Response - Average number of words per utterance calculated by dividing the total number of words directed to the infant by the total number of utterances addressed to the infant.
4. Type Token Ratio - Shows lexical diversity; provides a general idea of semantic use; the total number of different word types (categories) are divided by the total number of words in the entire sample.
5. Sentence Types:
   A. Questions - Utterances spoken primarily with a rising intonation or grammatical form desginating a question. Interrogative forms included wh-, yes-no and tag elements. For tag questions, forms such as 'huh' were included
   B. Commands - Utterances telling the infant to perform some action; may be positive request spoken with persuading tone, negative request spoken with forceful or pleading tone, or neutral request suggesting compromise and spoken with neutral tone
   C. Declaratives - Utterances that function as comments which name or

point out objects, people or events; may express some observation spoken with primarily a neutral tone

D. Exclamations - Utterances, usually one or two words, not considered a complete sentence; spoken primarily with a strong intonation such as 'oh' or 'gosh'; may function as a conversational filler or serve as an attention getting device; limited syntactic or semantice content

Table 1. Infant Communicative / Interactive Behaviors

Infant Behavior	Duration (in mins and secs)		Frequency of Occurrence (number of episodes)	
	FTT Infant (N=15' 06")	MI Infant (N=6' 13")	FTT Infant (N=15' 06")	MI Infant (N=6' 13")
Type Vocalization				
Noncry	05"	25"	5	25
Fuss/Cry	1' 40"	1' 00"	12	9
Vegetative (e.g., cough, sneeze)	03"	02"	3	1
Vocalization & Gaze at Mother	0	5' 08"	0	32
Vocalization & Gaze at Observer[a]	0	0	0	0
Gaze at Mother	23"	5' 50"	5	33
Gaze at Observer	56"	0	2	0
Smiles at Mother	16"	42"	4	6
Smiles at Observer	41"	0	2	0

[a] Observer's talking time to FTT baby - 2'03"; to MI baby - 0

Table 2. Maternal Proximity and Holding Patterns

Maternal Distance from Infant	Type of Holding Pattern	Duration (in mins and secs)
	MSN	
3 - 4 Feet	Baby in infant seat (mother does not attempt en face position)	4'
	Baby in infant seat (mother attempts en face position)	3' 14"
0 - 2 Feet	Mother attempts en face position; tries to get child to stand	3' 47"
	Mother holds baby in sitting position; infant's face positioned away from Mother	1' 07"
	Mother holds baby in arms, but faces self away from infant	3' 38"
	Total Tape Time	15' 06"
	MMI[a]	
0 - 1 Foot	Mother attempts en face position	6' 13"
	Total Tape Time	6' 13"

[a] Due to manner in which tape was recorded, other types of holding patterns could not be measured

Table 3. Primary Direction of Maternal Pitch Patterns

Pitch Direction	Percent Occurrence (%) MSN	MMI
Rising	26	45
Falling	5	2
Level	33	6
Rising-Falling	7	9
Falling-Rising	8	20
Rise + Fall	.5	2
Fall + Rise	1	16
Whisper	19	0

Table 4. Totals for Comparative Talking Time of Maternal Utterances

Measure	MSN	MMI
Talking Time to Infant	15' 06"	6' 13"
Number Utterances to Infant	424	124
Rate of Utterances per Minute	28.2	20.2
Number Words to Infant	1405	497
Mean Length of Response (MLR)	3.2	4.0
Type Token Ratio (TTR)	.30	.33

Table 5. Percent Occurrence of Word Types Addressed to Infants

Word Type (Category)	Percent Occurrence (%) MSN	MMI
1. Nouns	10	14
2. Adjectives	5	8
3. Articles	3	2
4. Verbs	27	19
5. Auxuliaries	2	1
6. Adverbs	15	11
7. Prepositions	5	10
8. Conjunctions	1	1
9. Pronouns	24	18
10. Exclamations	8	16

Table 6. Percent Occurrence of Maternal Sentence Types

Sentence Type	Percent Occurrence (%) MSN	MMI
Commands	46	0
Exclamations	24	33
Declaratives	10	29
Questions		
yes-no	4	10
tag	4	21
wh-	1	7
Total Questions	10	38
Unintelligible	1	0